

Fig.1

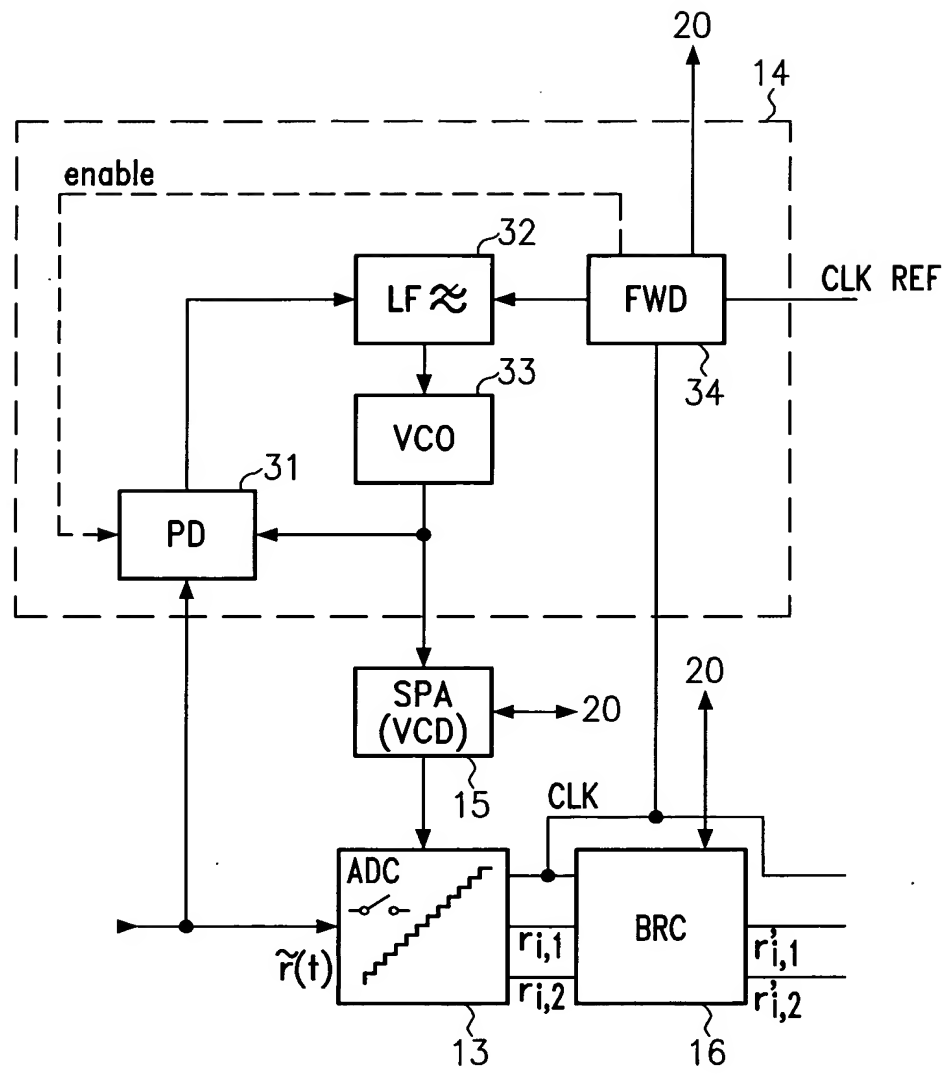


Fig.2

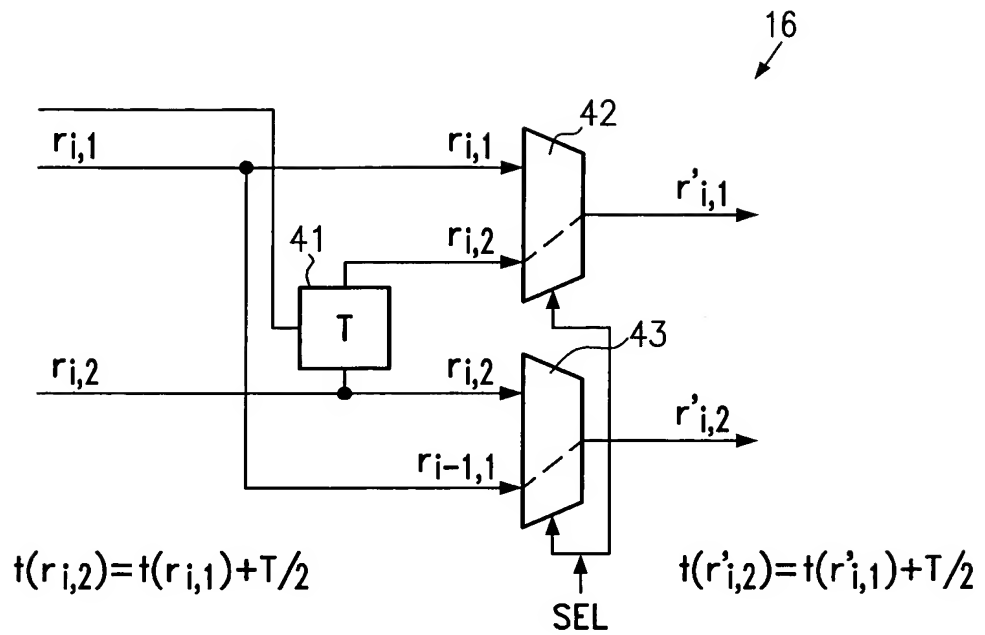
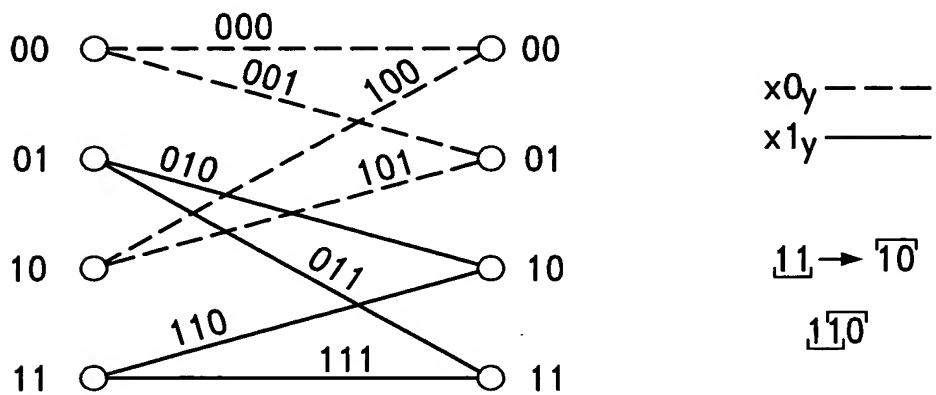
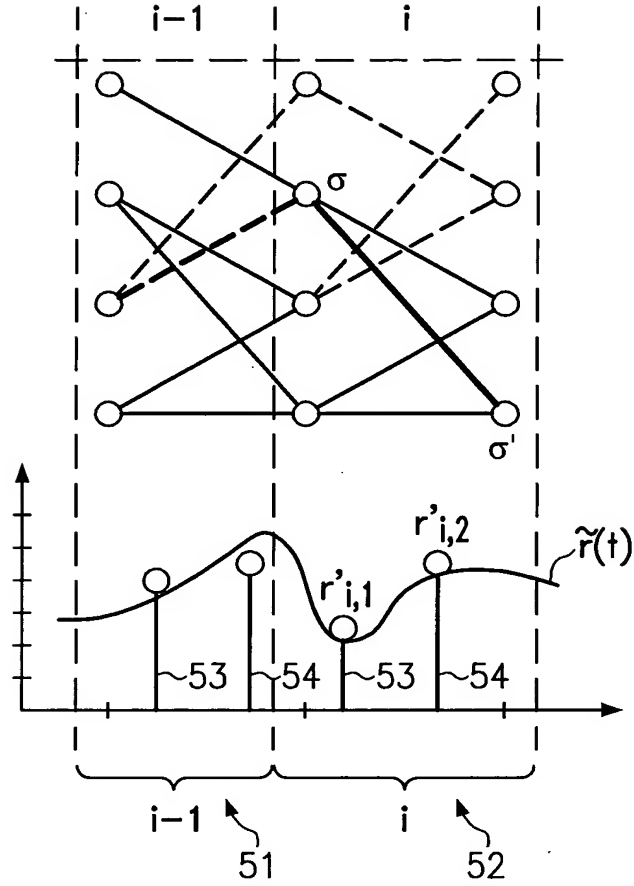


Fig.3



ISI-Trellis, M=2

Fig.4



Brauch-Metric

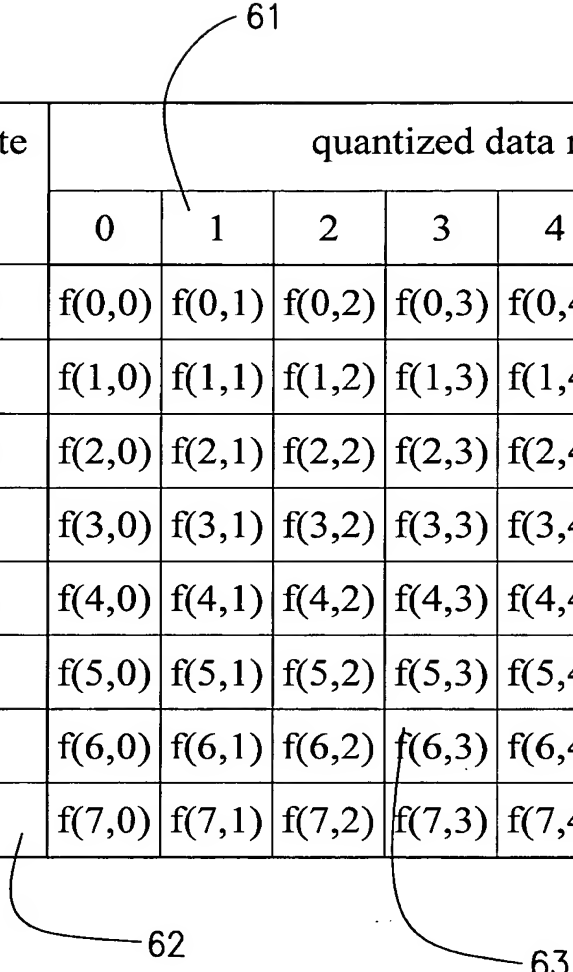
$$BM_{\text{tot}}(\underline{\mathbf{b}}, r_1, r_2) = BM(\underline{\mathbf{b}}, r_1) + BM(\underline{\mathbf{b}}, r_2)$$

$$BM_{\text{tot}}(\underline{\mathbf{b}}, r_1, r_2) = BM_1(\underline{\mathbf{b}}, r_1) + BM_2(\underline{\mathbf{b}}, r_1, r_2)$$

$$BM_{\text{tot}}(\underline{\mathbf{b}}, r_1, r_2) = BM(\underline{\mathbf{b}}, r_1, r_2)$$

$$BM_{\text{tot}}(\underline{\mathbf{b}}, r_1, r_2) = BM_1(\underline{\mathbf{b}}, r_1) + BM_2(\underline{\mathbf{b}}, R(r_1), r_2)$$

Fig.5



channel state <u>b</u>	quantized data r_1 or r_2							
	0	1	2	3	4	5	6	7
<u>b</u> (0)=000	f(0,0)	f(0,1)	f(0,2)	f(0,3)	f(0,4)	f(0,5)	f(0,6)	f(0,7)
<u>b</u> (1)=001	f(1,0)	f(1,1)	f(1,2)	f(1,3)	f(1,4)	f(1,5)	f(1,6)	f(1,7)
<u>b</u> (2)=010	f(2,0)	f(2,1)	f(2,2)	f(2,3)	f(2,4)	f(2,5)	f(2,6)	f(2,7)
<u>b</u> (3)=011	f(3,0)	f(3,1)	f(3,2)	f(3,3)	f(3,4)	f(3,5)	f(3,6)	f(3,7)
<u>b</u> (4)=100	f(4,0)	f(4,1)	f(4,2)	f(4,3)	f(4,4)	f(4,5)	f(4,6)	f(4,7)
<u>b</u> (5)=101	f(5,0)	f(5,1)	f(5,2)	f(5,3)	f(5,4)	f(5,5)	f(5,6)	f(5,7)
<u>b</u> (6)=110	f(6,0)	f(6,1)	f(6,2)	f(6,3)	f(6,4)	f(6,5)	f(6,6)	f(6,7)
<u>b</u> (7)=111	f(7,0)	f(7,1)	f(7,2)	f(7,3)	f(7,4)	f(7,5)	f(7,6)	f(7,7)

Fig.6

61

channel state <u>b</u>	quantized data r_1 or r_2							
	0	1	2	3	4	5	6	7
<u>b</u> (0)	BM(0,0)	BM(0,1)	BM(0,2)	BM(0,3)	BM(0,4)	BM(0,5)	BM(0,6)	BM(0,7)
<u>b</u> (1)	BM(1,0)	BM(1,1)	BM(1,2)	BM(1,3)	BM(1,4)	BM(1,5)	BM(1,6)	BM(1,7)
<u>b</u> (2)	BM(2,0)	BM(2,1)	BM(2,2)	BM(2,3)	BM(2,4)	BM(2,5)	BM(2,6)	BM(2,7)
<u>b</u> (3)	BM(3,0)	BM(3,1)	BM(3,2)	BM(3,3)	BM(3,4)	BM(3,5)	BM(3,6)	BM(3,7)
<u>b</u> (4)	BM(4,0)	BM(4,1)	BM(4,2)	BM(4,3)	BM(4,4)	BM(4,5)	BM(4,6)	BM(4,7)
<u>b</u> (5)	BM(5,0)	BM(5,1)	BM(5,2)	BM(5,3)	BM(5,4)	BM(5,5)	BM(5,6)	BM(5,7)
<u>b</u> (6)	BM(6,0)	BM(6,1)	BM(6,2)	BM(6,3)	BM(6,4)	BM(6,5)	BM(6,6)	BM(6,7)
<u>b</u> (7)	BM(7,0)	BM(7,1)	BM(7,2)	BM(7,3)	BM(7,4)	BM(7,5)	BM(7,6)	BM(7,7)

62

64

$$BM_{\text{tot}}(\underline{\mathbf{b}}, r_1, r_2) = BM(\underline{\mathbf{b}}, r_1) + BM(\underline{\mathbf{b}}, r_2)$$

Fig.7

65

channel state \underline{b}	quantized data r_1				
	0	...	r_1	...	7
$\underline{b}_0=000$	$BM_1(0,0)$	...	$BM_1(0,r_1)$	...	$BM_1(0,7)$
...
\underline{b}_s	$BM_1(s,0)$	...	$BM_1(s,r_1)$	...	$BM_1(s,7)$
...
$\underline{b}_7=111$	$BM_1(7,0)$	...	$BM_1(7,r_1)$	...	$BM_1(7,7)$

Fig.8

62 67 66

channel state \underline{b}	quantized data r_2 , BM_2 conditioned on $r_1=1$				
	0	...	r_2	...	7
$\underline{b}_0=000$	$BM_2(0,r_1,0)$	...	$BM_2(0,r_1,r_2)$	...	$BM_2(0,r_1,7)$
...
\underline{b}_s	$BM_2(s,r_1,0)$	...	$BM_2(s,r_1,r_2)$	...	$BM_2(s,r_1,7)$
...
$\underline{b}_7=111$	$BM_2(7,r_1,0)$	...	$BM_2(7,r_1,r_2)$	...	$BM_2(7,r_1,7)$

62 68

$$BM_{tot}(\underline{b}, r_1, r_2) = BM_1(\underline{b}, r_1) + BM_2(\underline{b}, r_1, r_2)$$

69

Fig.9

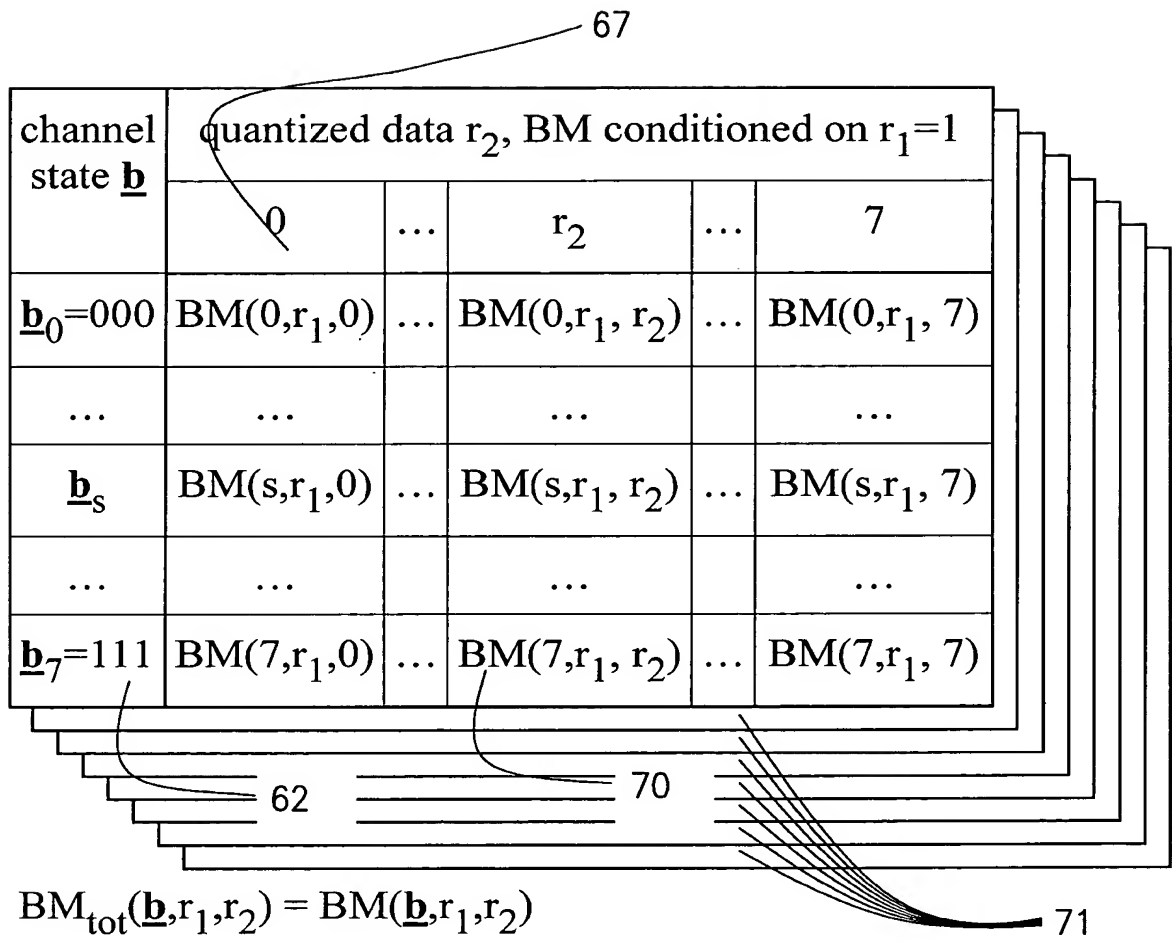


Fig.10

67

channel state $\underline{\mathbf{b}}$	quantized data r_2 , BM_2 conditioned on $R(r_1)=1$				
	0	...	r_2	...	7
$\underline{\mathbf{b}}_0=000$	$\text{BM}_2(0, R(r_1), 0)$	...	$\text{BM}_2(0, R(r_1), r_2)$	...	$\text{BM}_2(0, R(r_1), 7)$
...
$\underline{\mathbf{b}}_s$	$\text{BM}_2(s, R(r_1), 0)$	...	$\text{BM}_2(s, R(r_1), r_2)$	...	$\text{BM}_2(s, R(r_1), 7)$
...
$\underline{\mathbf{b}}_7=111$	$\text{BM}_2(7, R(r_1), 0)$	...	$\text{BM}_2(7, R(r_1), r_2)$	...	$\text{BM}_2(7, R(r_1), 7)$

62 72 73

$$\text{BM}_{\text{tot}}(\underline{\mathbf{b}}, r_1, r_2) = \text{BM}_1(\underline{\mathbf{b}}, r_1) + \text{BM}_2(\underline{\mathbf{b}}, R(r_1), r_2)$$

Fig.11

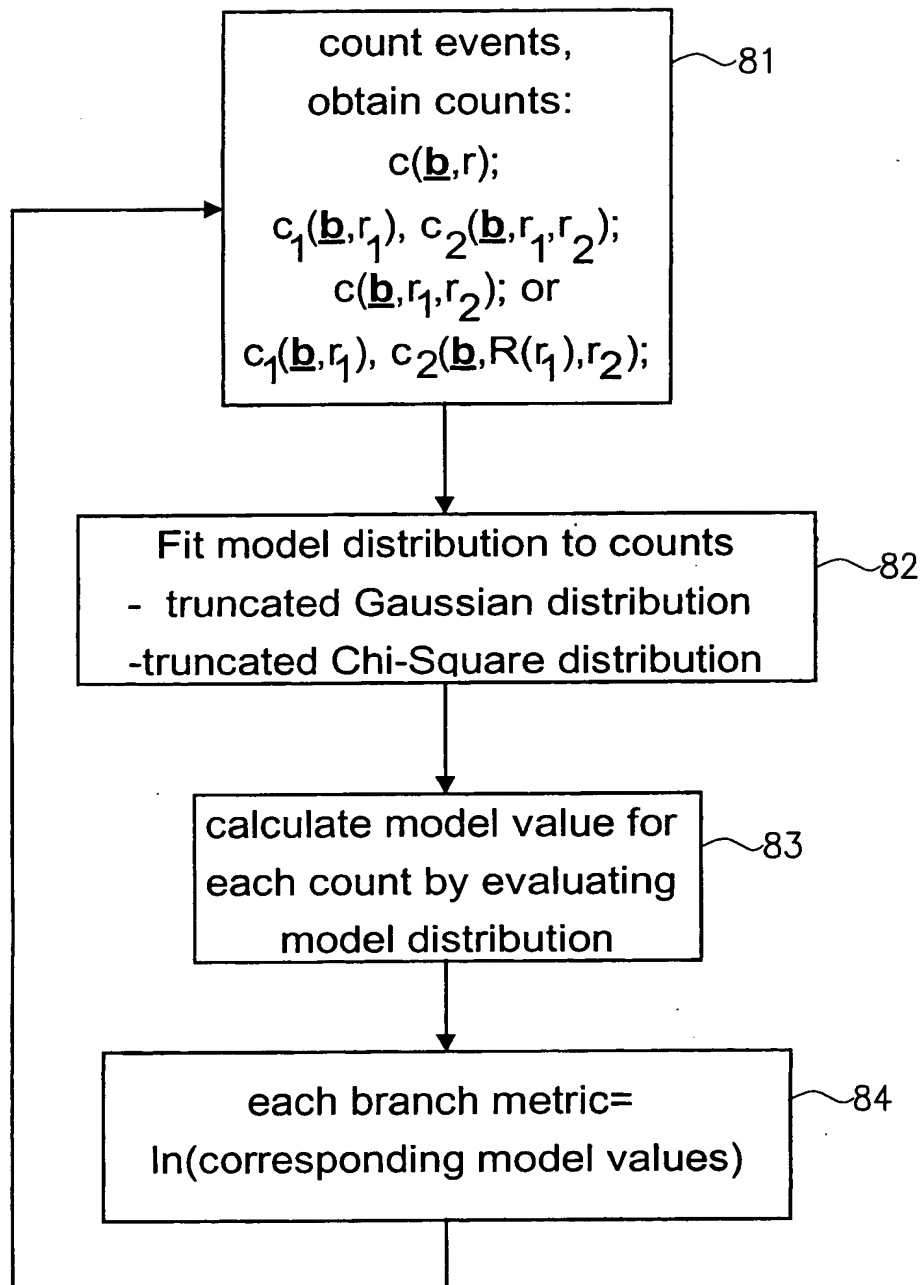


Fig.12

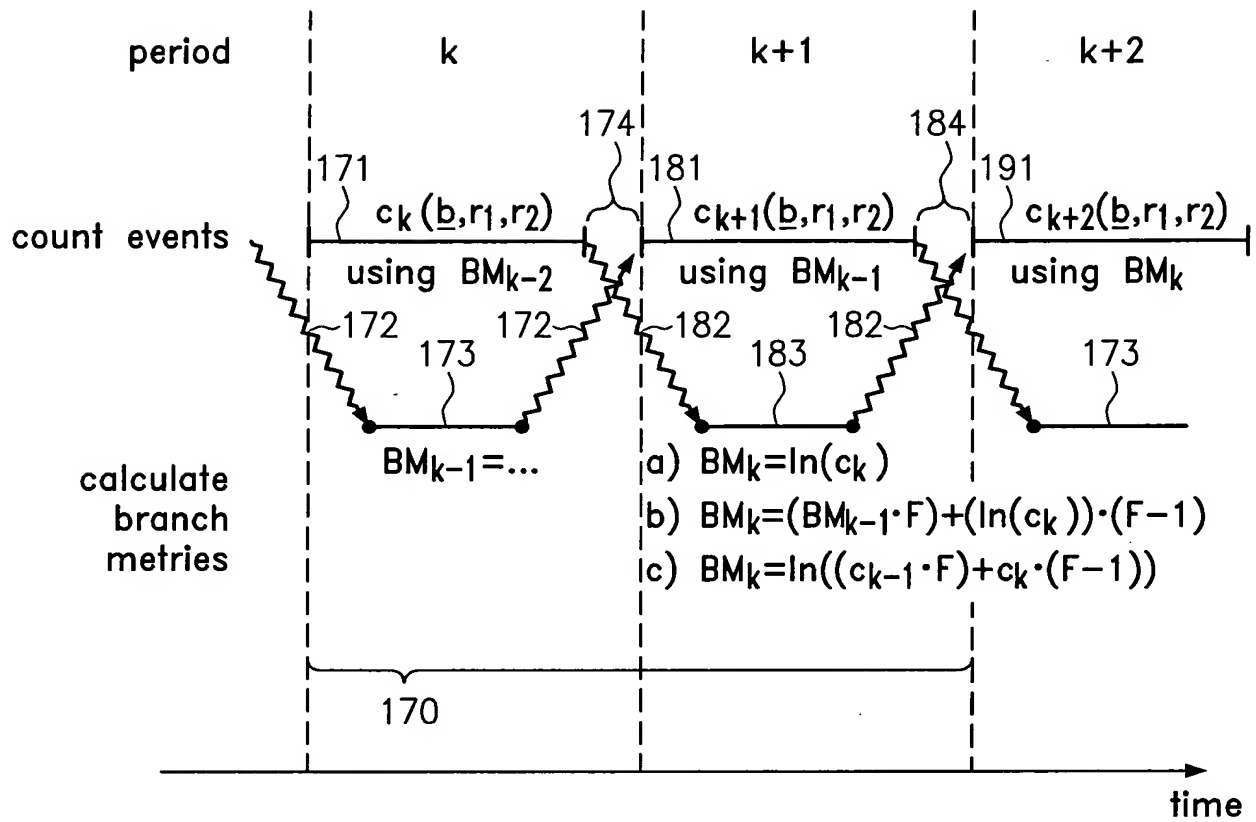


Fig.13

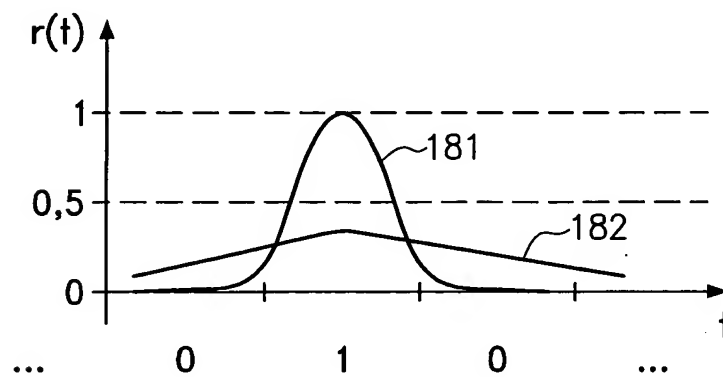


Fig.14

Starting Channel Model

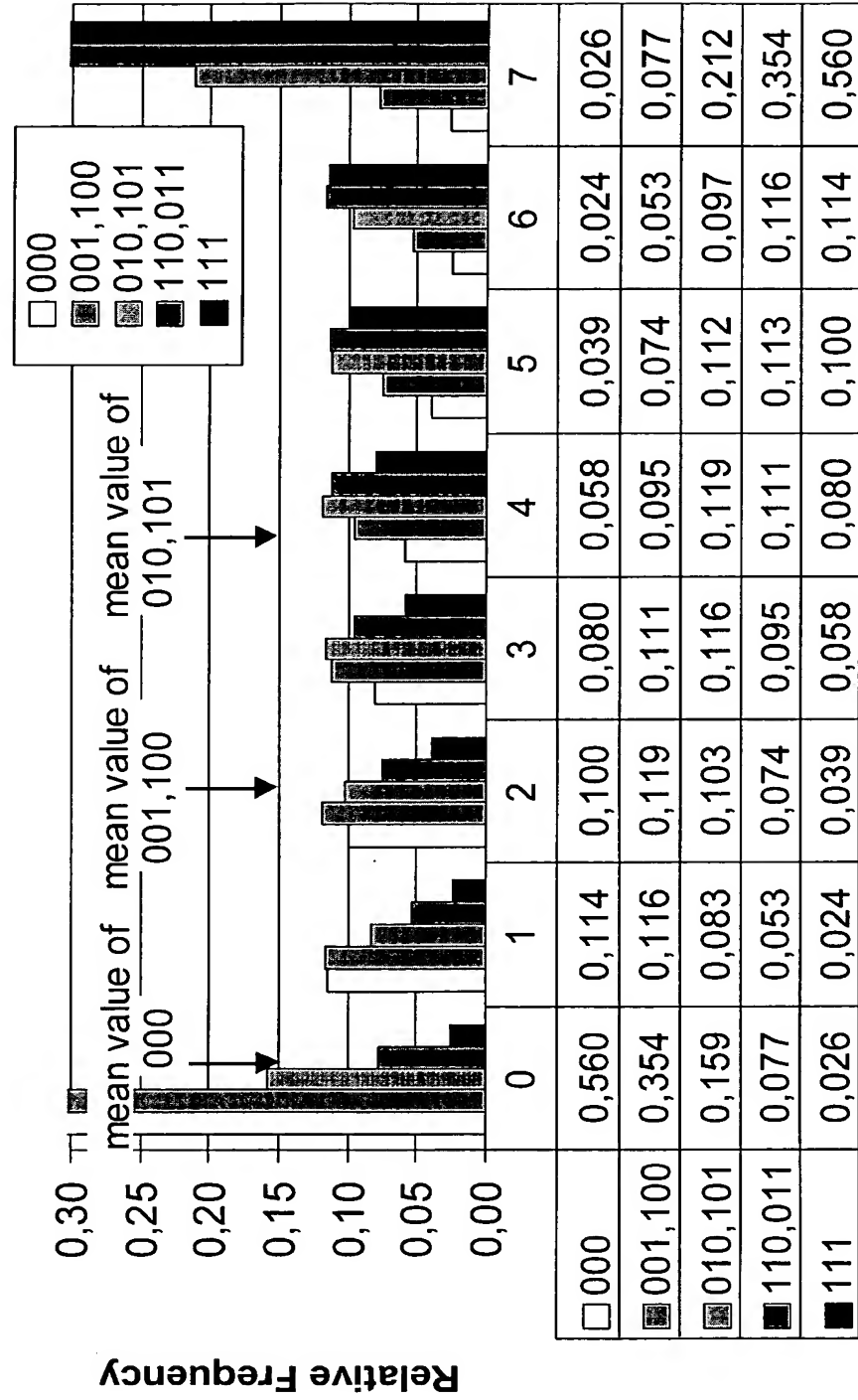


Fig.15

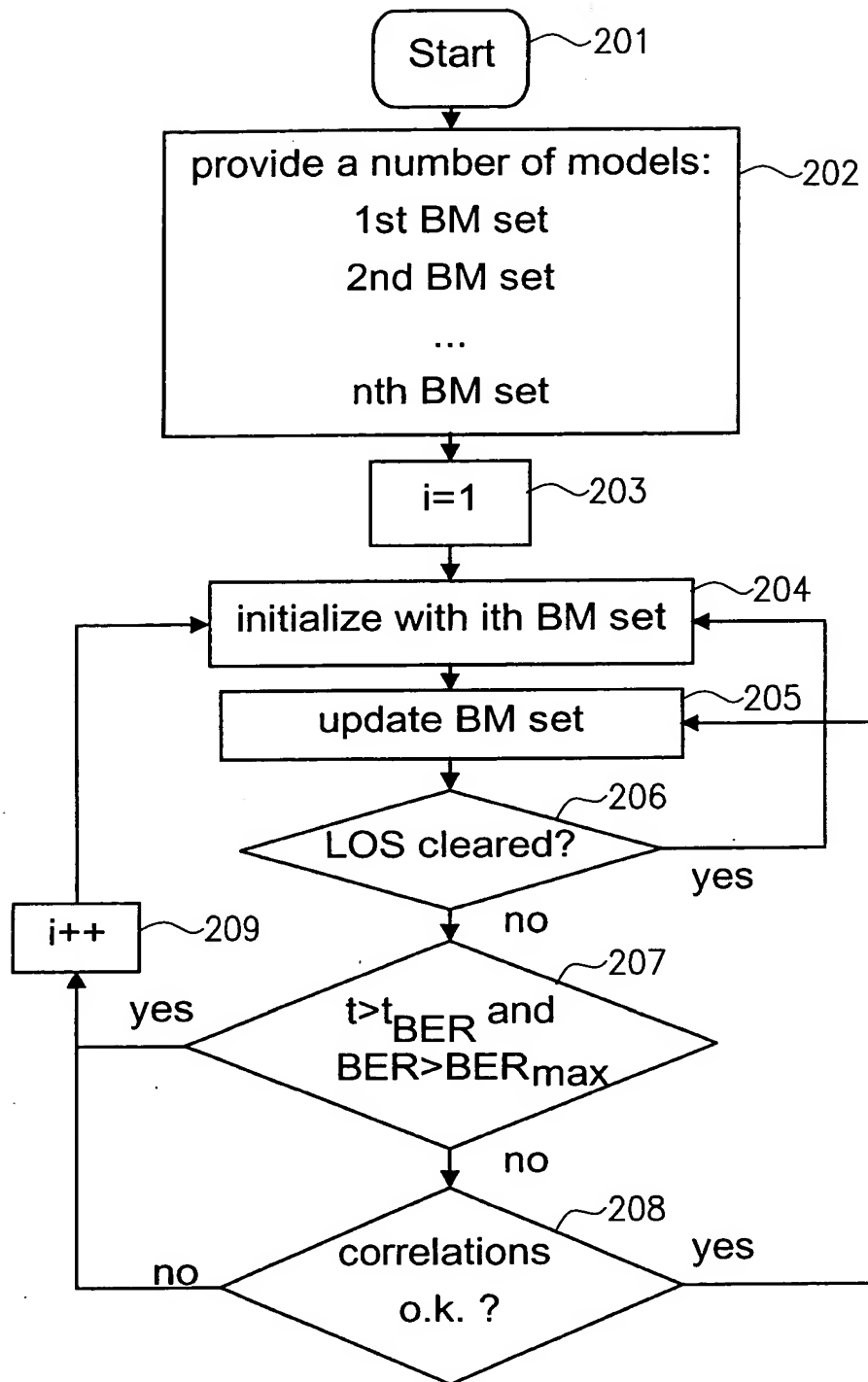


Fig.16

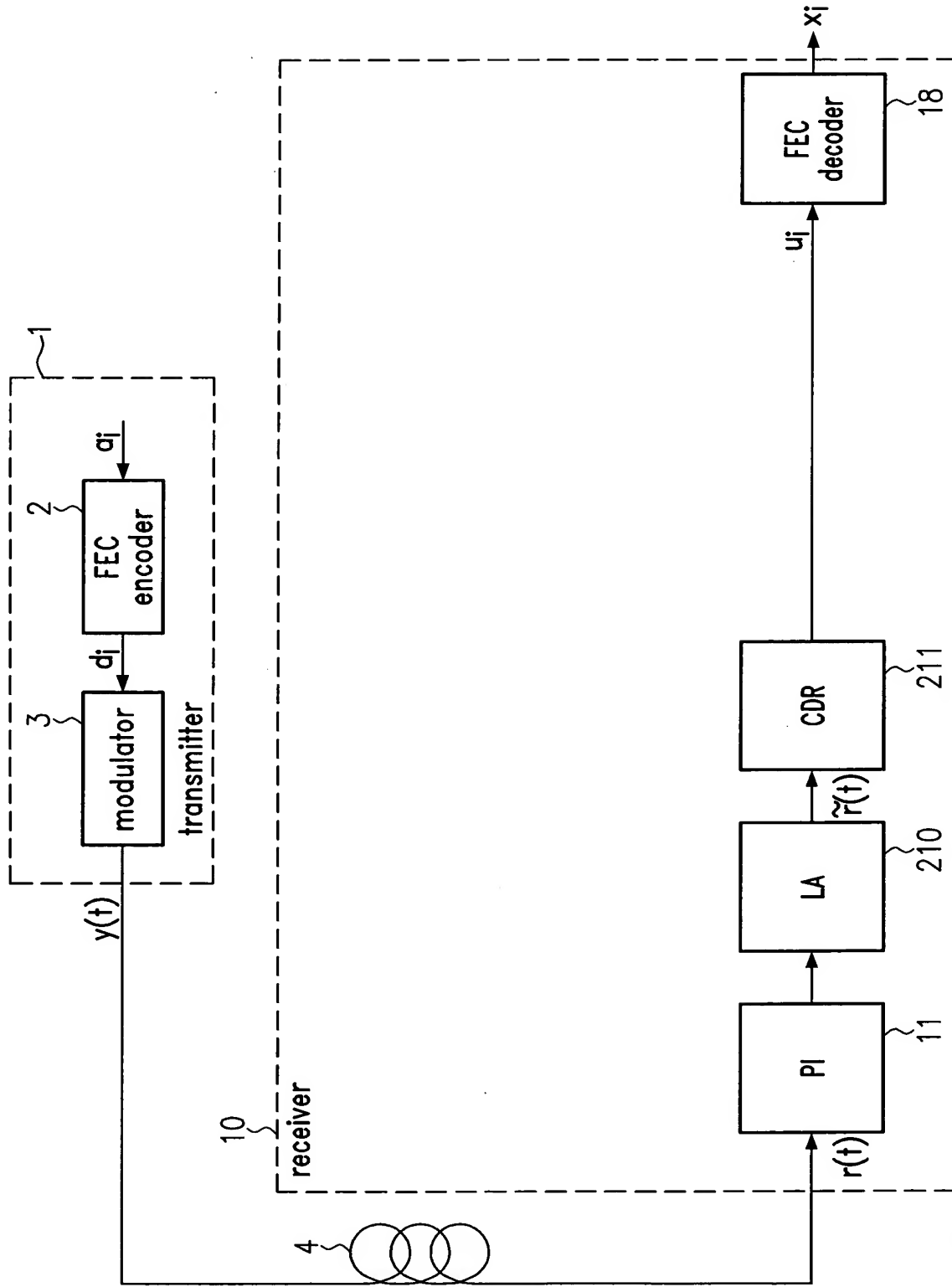


Fig.17